

What is claimed is:

1. A linearizer for an amplifier, comprising:
a signal adjuster having an internal signal;
an adaptation controller for monitoring said signal adjuster, the internal signal at an input to said adaptation controller being deemed a monitor signal, said adaptation controller generating a control signal for said signal adjuster by accounting for a difference between the internal and monitor signals.
2. A linearizer according to Claim 1, wherein said adaptation controller determines a response of an observation filter representing the difference between the internal and monitor signals.
3. A linearizer according to Claim 2, wherein said adaptation controller accounts for the difference between the internal and monitor signals by dividing the monitor signal by the observation filter response.
4. A linearizer according to Claim 1, wherein said signal adjuster and amplifier forms part of a signal cancellation circuit of said linearizer.
5. A linearizer according to Claim 4, wherein said signal adjuster is in series with the amplifier in the signal cancellation circuit.

6. A linearizer according to Claim 5, wherein said signal adjuster is in parallel with the amplifier in the signal cancellation circuit.

7. A linearizer according to Claim 1, wherein said signal adjuster forms part of a distortion cancellation circuit of said linearizer.

8. A linearizer according to Claim 1, wherein said signal adjuster comprises an analog predistorter.

9. A linearizer according to Claim 1, wherein said signal adjuster comprises an FIR filter.

10. A linearizer according to Claim 1, wherein said signal adjuster comprises a filter having a linear combination of frequency-dependent nonlinearities.

11. A method for generating a control signal for a signal adjuster of an amplifier linearizer, wherein the signal adjuster has an internal signal, comprising the steps of:

monitoring a monitor signal using an adaptation controller, the internal signal at an input to the adaptation controller being deemed the monitor signal;

generating a control signal for the signal adjuster by accounting for a difference between the internal and monitor signals.

12. A method according to Claim 11, further comprising the step of determining a response of an observation filter representing the difference between the internal and monitor signals.

13. A method according to Claim 12, wherein said adaptation controller accounts for the difference between the internal and monitor signals by dividing the monitor signal by the observation filter response.

14. A method for self-calibrating a linearizer for an amplifier, the linearizer having a signal adjuster circuit with a plurality of complex gain adjusters, and an adaptation controller, the signal input to each of the complex gain adjusters being output from the signal adjuster circuit to the adaptation controller, said method comprising the steps of:

- (1) setting the amplifier to standby so its output is zero;
- (2) setting a complex gain of a first complex gain adjuster to a nominal value and the other complex adjuster gains to zero;
- (3) applying an input signal to the adjuster circuit, the negative output of the adjuster circuit being an error signal;
- (4) bandpass correlating the error signal with the input signal to the first complex gain adjuster to generate a first correlation value;
- (5) bandpass correlating the input signal to the first complex gain adjuster with itself to generate a second correlation value;

(6) computing a first observation filter response, corresponding to the first complex gain adjuster, by multiplying the nominal complex gain value by the second correlation value and by dividing by the first correlation value;

(7) repeating steps (2) through (6) to compute observation filter responses corresponding to the remaining complex gain adjusters, wherein a complex gain is set to a nominal value for each remaining complex gain adjuster, and the other complex adjuster gains are set to zero.

15. A method according to Claim 14, further comprising the step:

(8) adjusting the signal adjuster signals at the input of the adaptation controller by dividing them by the corresponding computed observation filter responses.

16. A method for self-calibrating a linearizer for an amplifier, the linearizer having a signal distortion adjuster circuit and a distortion adjuster circuit, the latter circuit having a plurality of complex gain adjusters, and an adaptation controller, the signal input to each of the complex gain adjusters being output from the distortion adjuster circuit to the adaptation controller, said method comprising the steps of:

(1) setting the amplifier to standby so its output is zero and setting the signal adjuster circuit to produce a non-zero value;

(2) setting a complex gain of a first complex gain adjuster to a nominal value and the other complex adjuster gains to zero;

(3) applying an input signal to the adjuster circuit so as to produce an output signal from the linearizer;

(4) bandpass correlating the output signal with the input signal to the first complex gain adjuster to generate a first correlation value;

(5) bandpass correlating the input signal to the first complex gain adjuster with itself to generate a second correlation value;

(6) computing a first observation filter response, corresponding to the first complex gain adjuster, by multiplying the nominal complex gain value by the second correlation value and by dividing by the first correlation value;

(7) repeating steps (2) through (6) to compute observation filter responses corresponding to the remaining complex gain adjusters of the distortion adjuster circuit, wherein a complex gain is set to a nominal value for each remaining complex gain adjuster, and the other complex adjuster gains are set to zero.

17. A method according to Claim 16, further comprising the step:

(8) adjusting the distortion adjuster signals at the input of the adaptation controller by dividing them by the corresponding computed observation filter responses.

18. A controller for controlling a signal adjuster of a linearizer for an amplifier, the signal adjuster having an internal signal, the controller comprising:

means for computing a difference between the internal signal, and the internal signal as it exists at an input to said controller (“the monitor signal”); and

means for adjusting the monitor signal based on the computed difference.

19. A controller according to Claim 18, further comprising means to compute a control signal for the signal adjuster using the adjusted monitor signal.